

Amendments to the Claims

1. **(Currently Amended)** A ~~scheme~~ method for transmitting an OFDM signal from a transmission side to a reception side, wherein

the said OFDM signal comprises at least one ~~includes both a data symbol consisting of a plurality of subcarriers having data therein, and at least one a pilot symbol including a plurality of subcarriers, at least one of the subcarriers having a frequency component predetermined in amplitude and phase, said method comprising:~~

inserting, on said the transmission side, the said pilot symbol is inserted before or after one or more said data symbols, and transmitting the pilot symbol is transmitted together with one or more said data symbols; and

utilizing, on said the reception side, the received pilot symbol is utilized for compensating for a frequency response variation of a transmission path resulted from at least one any one or more of distortion observed in the transmission path, out-of-synchronization with passage of time, frequency drift, and residual phase error.

2. **(Currently Amended)** The OFDM signal transmission ~~scheme~~ method according to claim 1, wherein every subcarrier included in ~~said the~~ pilot symbol is a pilot carrier predetermined in amplitude and phase.

3. **(Currently Amended)** The OFDM signal transmission ~~scheme~~ method according to claim 1, wherein said inserting comprises sequentially inserting the pilot symbol and at least one additional pilot symbol is ~~plurally and sequentially inserted before or after one or more said data symbols.~~

4. **(Currently Amended)** The OFDM signal transmission ~~scheme~~ method according to claim 1, wherein said inserting comprises periodically inserting a pilot symbol is ~~periodically inserted before or after one or more said data symbols.~~

5. **(Currently Amended)** The OFDM signal transmission-scheme method according to claim 1, wherein said inserting comprises non-periodically inserting a pilot symbol-is ~~non-periodically inserted~~ before or after one or more-said data symbols.

6. **(Currently Amended)** The OFDM signal transmission-scheme method according to claim 51, further comprising adaptively changing-wherein, on-said the transmission side, a said pilot symbol-is adaptively changed in frequency and number for insertion depending on a state of the transmission path.

7. **(Currently Amended)** The OFDM signal transmission-scheme method according to claim 51, further comprising providing-wherein, on-said the transmission side, ~~said the~~ OFDM signal is ~~provided with~~ control information indicating how often-said and how many pilot-symbol-is symbols are inserted-and how many.

8. **(Currently Amended)** The OFDM signal transmission-scheme method according to claim 1, wherein the frequency response variation of-said the transmission path is compensated for by using a compensation vector calculated, as a time series linear approximation, from a difference in frequency response between any two pilot symbols closest to each other.

9. **(Currently Amended)** The OFDM signal transmission-scheme method according to claim 1, wherein the frequency response variation of-said the transmission path ~~resulted~~ resulting from at least either one or both of said the frequency drift and-said the residual phase error is compensated for by using a value calculated, as a time series linear approximation, from a difference in phase between any two pilot symbols closest to each other.

10. **(Currently Amended)** The OFDM signal transmission-scheme method according to claim 1, wherein the frequency response variation of-said the transmission path is compensated for by using an average value taken for a phase error among pilot carriers in said the pilot symbol.

11. **(Currently Amended)** The OFDM signal transmission-~~scheme~~ method according to claim 10, wherein-~~said~~ the average value is calculated by weighing each amplitude value for the pilot carriers.

12. **(Currently Amended)** An OFDM signal transmitter for transmitting an OFDM signal towards a reception side, said OFDM signal transmitter comprising:

a data symbol generator for generating an OFDM data symbol for-~~after~~ inputting data for transmission;

a pilot symbol generator for generating an OFDM pilot symbol; and

a symbol selector for switching between signals provided by said data symbol generator and said pilot symbol generator so that-~~said~~ the pilot symbol is inserted before or after one or more-~~said~~ data symbols.

13. **(Currently Amended)** The OFDM signal transmitter according to claim 12, wherein said data symbol generator comprises:

a frequency-domain data symbol generator for generating a frequency-domain data symbol after inputting the data for transmission; and

an inverse Fourier transformer for subjecting a signal provided by said frequency-domain data symbol generator to inverse Fourier transform, and

said pilot symbol generator comprises:

a frequency-domain pilot symbol generator for generating a frequency-domain pilot symbol; and

an inverse Fourier transformer for subjecting a signal provided by said frequency-domain pilot symbol generator to inverse Fourier transform.

14. **(Currently Amended)** An OFDM signal receiver for receiving, from a transmission side, an OFDM signal comprising at least one ~~including~~ a data symbol consisting of a plurality of subcarriers having data therein, and a at least one pilot symbol including a plurality of subcarriers, at least one of the subcarriers having a frequency

component predetermined in amplitude and phase, and being inserted before or after one or more ~~said~~ data symbols, said OFDM signal ~~the receiver comprising:~~

a Fourier transformer for subjecting ~~said~~ the received OFDM signal to Fourier transform;

a transmission path frequency response compensator for detecting ~~said~~ the pilot symbol from a signal provided by said Fourier transformer, and, with respect to the signal, compensating for a frequency response variation of a transmission path; and

a demodulator for receiving the signal compensated for ~~with~~ the frequency response variation of the ~~said~~ transmission path, and demodulating the signal to output as demodulated data.

15. **(Currently Amended)** The OFDM signal receiver according to claim 14, wherein said transmission path frequency response compensator calculates a compensation vector for compensation, by referring to a frequency response of a pilot symbol, for a frequency response of another pilot symbol closest thereto, and a frequency response of a reference pilot symbol provided on a reception side, so that a frequency response of ~~said~~ the received data symbol corresponds to that of ~~said~~ the reference pilot symbol.

16. **(Currently Amended)** The OFDM signal receiver according to claim 15, wherein said transmission path frequency response compensator calculates a compensation vector ~~is calculated~~ for every subcarrier included in ~~said~~ the received data symbol by using every pilot carrier included in each of ~~said~~ the pilot symbols.

17. **(Currently Amended)** The OFDM signal receiver according to claim 15, wherein said transmission path frequency response compensator calculates the compensation vector ~~is calculated~~ as a time series linear approximation from the frequency response variation between any two pilot symbols closest to each other.

18. **(Currently Amended)** The OFDM signal receiver according to claim 14, wherein said transmission path frequency response compensator comprises:

a pilot symbol detector for detecting both a first pilot symbol being an arbitrary pilot symbol and a second pilot symbol transmitted after the first pilot symbol;

a first pilot symbol transmission path frequency response calculator for calculating a first pilot symbol transmission path frequency response by dividing a frequency response of ~~said the~~ first pilot symbol by that of a reference pilot symbol provided on a reception side;

a second pilot symbol transmission path frequency response calculator for calculating a second pilot symbol transmission path frequency response by dividing a frequency response of ~~said the~~ second pilot symbol by that of ~~said the~~ reference pilot symbol;

a compensation vector calculator for calculating, after inputting ~~said the~~ first and second pilot symbol transmission path frequency responses thereto, a compensation vector for compensating for the frequency response variation of ~~said the~~ transmission path; and

a frequency response compensator for compensating for the frequency response of one or more ~~said~~ data symbols after inputting ~~said the~~ compensation vector.

19. **(Currently Amended)** An OFDM signal receiver for receiving, from a transmission side, an OFDM signal comprising at least one including a data symbol consisting of a plurality of subcarriers having data therein, and a at least one pilot symbol including a plurality of subcarriers, at least one of the subcarriers having a frequency component predetermined in amplitude and phase, and being inserted before or after one or more said data symbols, said OFDM signal the receiver comprising:

a Fourier transformer for subjecting ~~said the~~ received OFDM signal to Fourier transform;

a phase compensator for detecting ~~said the~~ pilot symbol from a signal provided by said Fourier transformer, and compensating the signal for ~~either at least one or both~~ of frequency drift and residual phase error; and

a demodulator for receiving the signal compensated ~~with~~ for the at least one ~~either~~ ~~or both~~ of the frequency drift and the residual phase error, and demodulating the signal to output demodulated data.

20. **(Currently Amended)** The OFDM signal receiver according to claim 19, wherein said phase compensator calculates a compensation value for compensation, by referring to a first difference between a phase of a pilot symbol and a predetermined phase, and a second difference in phase between any two pilot symbols closest to each other, so that a phase of ~~said~~ the received data symbol corresponds to ~~said~~ the predetermined phase.

21. **(Currently Amended)** The OFDM signal receiver according to claim 20, wherein said phase compensator calculates the first and second differences ~~are each calculated~~ by using a phase average value calculated for every pilot carrier included in each of the pilot symbols.

22. **(Currently Amended)** The OFDM signal receiver according to claim 21, wherein said the phase average value is calculated by weighing each amplitude value for ~~said~~ the pilot carriers.

23. **(Currently Amended)** The OFDM signal receiver according to claim 20, wherein said phase compensator calculates the phase compensation value ~~is calculated~~ as a time series linear approximation from a difference in phase between any two pilot symbols closest to each other.

24. **(Currently Amended)** The OFDM signal receiver according to claim 19, wherein said phase compensator comprises:

a pilot symbol detector for detecting both a first pilot symbol being an arbitrary pilot symbol and a second pilot symbol transmitted after the first pilot symbol;

a first pilot symbol phase difference calculator for calculating a difference between a phase of ~~said~~ the first pilot symbol and a predetermined phase;

a pilot symbol phase difference calculator for calculating a difference in phase between ~~said~~ the first pilot symbol and ~~said~~ the second pilot symbol;

a phase compensation value calculator for calculating, after inputting the phase difference value calculated by said first pilot symbol phase difference calculator and the phase difference calculated by said pilot symbol phase difference calculator thereto, a phase compensation value for compensating for the at least one of the frequency drift and the residual phase error; and

a phase rotator for rotating, in response to ~~said~~ the phase compensation value, ~~the~~ a phase of ~~said one or more~~ the data ~~symbols~~ symbol.

25. ~~(New)~~ The OFDM signal transmitter according to claim 12, wherein said data symbol generator comprises:

a frequency-domain data symbol generator for generating a frequency-domain data symbol after inputting the data for transmission; and

a time-domain data symbol converter for converting the frequency-domain data symbol into a time-domain data symbol, and

said pilot symbol generator comprises:

a frequency-domain pilot symbol generator for generating a frequency-domain pilot symbol; and

a time-domain pilot symbol converter for converting the frequency-domain pilot symbol into a time-domain pilot symbol.

26. ~~(New)~~ An OFDM signal receiver for receiving, from a transmission side, an OFDM signal comprising at least one data symbol consisting of a plurality of subcarriers having data therein, and at least one pilot symbol including a plurality of subcarriers, at least one of the subcarriers having a frequency component predetermined in amplitude and phase, and being inserted before or after one or more data symbols, said OFDM signal receiver comprising:

a frequency-domain data symbol generator for generating a frequency-domain data symbol from the received OFDM signal;

a transmission path frequency response compensator for detecting the pilot symbol from a signal provided by said frequency-domain data symbol generator, and with respect to the signal, compensating for a frequency response variation of a transmission path; and

a demodulator for receiving the signal compensated for the frequency response variation of the transmission path, and demodulating the signal to output demodulated data.

27. (New) The OFDM signal receiver according to claim 26, wherein said transmission path frequency response compensator calculates a compensation vector for compensation by referring to a frequency response of a pilot symbol, a frequency response of another pilot symbol closet thereto, and a frequency response of a reference pilot symbol provided on a reception side, so that a frequency response of the received data symbol corresponds to that of the reference pilot symbol.

28. (New) An OFDM signal receiver for receiving, from a transmission side, an OFDM signal comprising at least one data symbol consisting of a plurality of subcarriers having data therein, and at least one pilot symbol including a plurality of subcarriers, at least one of the subcarriers having a frequency component predetermined in amplitude, and being inserted before or after one or more data symbols, said OFDM signal receiver comprising:

a frequency-domain data symbol generator for generating a frequency-domain data symbol from the received OFDM signal;

a phase compensator for detecting the pilot symbol from a signal provided by said frequency-domain data symbol generator, and compensating the signal for at least one of frequency drift and residual phase error; and

a demodulator for receiving the signal compensated for the at least one of the frequency drift and the residual phase error, and demodulating the signal to output demodulated data.
